chain, Ie, Ihoya, and Kudaka islands. The main island is about sixty miles long, its length running generally northeast to southwest. It has an irregular coast line, peninsulas which jut out into the sea, and two isthmuses, one near present Camp Kue, the other farther north at Ishikawa. The width of the island varies from two to eighteen miles. 133 131

Okinawa may be divided into three geographical regions, which also roughly correspond to the ancient division of the island into a northern district (Kunigami or Yambaru), a central district (Nakagami), and a southern district (Shimajiri). [631]

The northern district takes up about two-thirds of the area of the island. It begins at the northern isthmus which runs from Ishikawa town on the Pacific side to Nakadomari on the East China Sea side. South of this line, the island runs more or less in a north-south direction; north of the line, the island is situated in a pronounced northeast-southwest direction. Certain features distinguish this northern area from the two southern parts of Okinawa. A mountain ridge, almost entirely forested, runs down the center. Drainage from the short streams which rise in the mountains is down the east and west slopes. Villages and towns are on or near the coastal flatlands or on the coastal rolling hills. There are few settlements in the interior of the northern part of the island. 131 631 133 [137] [361]

The central region of the island extends south from the Ishikawa-Nakadomari isthmus to the Naha-Yonabaru line. A corridor beginning on the eastern side at Yonabaru on Buckner Bay (formerly Nakagusuku-wan) connects with a long valley beginning around Naha. This provides a natural route cutting across the southern part of the island. The central region is the area of oldest settlement. It and the region to the south were the areas of the most intensive warfare during the campaign for Okinawa. The central region has a patternless physiography. Low rolling eroded hills, stony hills with sharp relief, dissected uplands and escarpments alternate with small alluvial valleys and flatlands. On these and on the lower slopes of the less stony hills cultivation takes place. Limestone sinks and caverns are commonplace. The most rugged terrain in this area is the region around Shuri and its northern approaches, the scene of the most prolonged fighting of the war in Okinawa. Unlike the north, settlements are scattered throughout the countryside, usually on the low lands at the base of hills, along the coasts, or in narrow winding valleys with low passes leading from one to the other. [480] [361]

The third region of the island extends from the Naha-Yonabaru line to the southern tip of the island. It is like the central part in the haphazard distribution of its land forms but somewhat flatter. Part of it is a limestone plain. The highest elevations are around the hills and mountains along Buckner Bay, with its narrow flat coastal strips, and along the southern portion of the Chinen peninsula, which also has flat beaches and beach ridges. It is an area of small plains, long, narrow but steep limestone mountains, and of rolling hills, escarpments which often abruptly end on the water's edge. In the area of one of these escarpments, Yaeju Dake, the final battle scenes of the war took place. The settlement

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

175 succeeded in shearing the noro system of much of its political power.
178 During the early part of the 18th century, there was an improvement in
642 agricultural methods and in forestry conservation, associated with the name of the statesman, Hozui Saion (1682-1761).[18] Saion was a descendant of a Chinese who had settled at Kume near Naha. He is said to have
175 planted several kinds of trees, including the pine, the Japanese red-
[130] wood (sugi), and the maki (in Japanese; podocarpus ssp.) Saion is well
241 remembered in Okinawa. In Matsuda, I was shown trees which were said
185 to have been planted along the road to Ginoza during Saion's lifetime and at his inspiration. There are stories told in the forest areas like Matsuda, crediting Saion with intentionally inventing superstitions to prevent people from cutting down the trees. In 1951, a Saion commemorative stamp was issued, and his name is used frequently in forest conservation literature and in posters. Whether Saion was the medium through which agricultural techniques of Japan or China were introduced, or whether these improvements came from his own initiative and study of local conditions, I have been unable to determine. In any case, the teachings of Saion on agriculture and forestry must have reached to the rural areas, improving the agricultural possibilities and encouraging planting trees and preserving the forests, constantly subject to destruction through fire, carelessness, and merciless cutting for firewood, as has been the case in many parts of China. These improvements, with the advantages from the introduction of the sweet potato one hundred years earlier, took place within the framework of a political and
[178] social and religious system that had now been well established.

5

European Awareness of the Great Loochoo

175 The Loochooans were known to the Portugese through the trade cen-
648 tering at Malacca. The Portugese explorer Pinto had visited Tanegashima around 1542. Captain Broughton had been shipwrecked on Miyako to the south in 1798. But the western exploration of Okinawa itself was reserved for later times. During the nineteenth century, the Europeans, then the Americans, became aware of the people of the Great Loochoo.

The first detailed observations based on personal contact date from the works of Captain Basil Hall, and his surgeon, William M'Leod, who

[Text continues top of P. 35--Analyst]

18 In the manuscript history reproduced by Leavenworth, there is this passage: "In the 20th year of Kyoho /1735/, Hozui Saion fixed a system for the protection of forestry, and a forestry office and shipping office were established." Op. cit., 89. Saion's famous work, Eight Volumes of Forest Administration, I am told was destroyed in the war. Chamberlain, as cited, p. 310, says that Loochooan polity in the 17th century crystallized in a form it wore from then on.

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a suburb of Naha, thence to Shuri. They turned north, passed the ancient fortress of Nakagusuku, went over to the east coast, proceeding to the vicinity of Kanna. In Matsuda, which the exploring party apparently did not reach, there is still a story about Perry's expedition. It concerns a carving on stone placed on the top of a dramatically shaped rock on the seashore. According to local residents, this carving remained in place until it was shot off by an American soldier during the war.

Roughly around Kanna, the party crossed the island to the South China Sea or western side, and reached the village of Un-na (modern Onna), an engraving of which appears in the narrative and also in Bayard Taylor's India, China, and Japan. The return trip was down the coast, and the road led through Nachinato back to Naha. Coastal explorations were extensive. A new chart was an immense improvement over Hall's. Special attention was given to the Unten (Port Melville) and Shah Bay (Miyagishima and the area south of Ogimi).

Bayard Taylor, the famous traveller who had joined the expedition and wrote parts of the narrative, spoke of the interior of Okinawa in 1853 as a "terra incognita," and he was not exaggerating as far as Western knowledge was concerned.[22] This probably applied to the Japanese as well, for their stations were in Naha and an administrator or scholar of the Tokugawa era probably found little in agriculture, plant life, land tenure, and local history and ethnography to interest him.[23]

Upland agriculture, the hoeing of sweet potatoes, the planting and transplanting of rice, the manufacture of sugar were described much as they can be observed to this day in parts of Okinawa. They noted a sameness and a lack of variety in plant life, the planting of pines along the highways, the fences used as protection against the wild boar. The communal land system was remarked upon, the writers thinking it a "metayer system," that is a form of share-cropping in which the proprietor of the land and the cultivator receive equal, or agreed upon proportions. They described houses built on small stilts, the compounds, and the village granaries. They strolled through villages, poked their heads into huts, and wrote about the utensils in the kitchens. They theorized about the possible origins of the people and their connections with other races, discovered lingams which were interpreted as the ruins of "ancient Hindoo idolatry." They spoke of the glossy upswept hair and the hair pins according to rank.

[24] [137] [421] [342] [302]

The village granaries are gone; so has the land system and the costumes, and the long swept up hair of both sexes. Agricultural techniques and the care of the land have remained.

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[Text Continues TOP of P. 38 -- Analyst]

22 See Bayard Taylor's A visit to India, China, and Japan, in the year 1853. Chapters 30, 33, 36.

23 In the early 17th century the Japanese explored the island, took a census, and reorganized political administration. CA Handbook Ryukyu (Loochoo) Islands, 40.

The village is one of a series of settlements in a long narrow valley, on a limestone plain, bordered on the east by a steep ridge, up to 300 feet in elevation and running in a northwest and southeast direction, which divides the valley from the sea. On these cliff like formations, large outcrops are covered with shrubs and miscanthus grass. Lanes and roads lead from the valley floor to the summits of these hills, where villagers collect their firewood and grass for roof thatch. On the rocky, steep slopes of this seaward ridge, above the line of cultivation, is the tomb area. Precipitous and stony hills prevent cultivation, but occasionally a sharp tongue of land reaches far up the slope, its end protected from the rains and wash by a short stone fence.

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Between Gushichan and Hanashiro village, there is a bridge over a small stream, its upstream course obscured by its dispersion in the rice fields. The dirt road, gradually ascending, cuts through the main rice growing area of the village, on a gentle slope, reflected in the bench cultivation of the rice fields. Here and there are large rocks and stony outcrops, with an occasional scrub pine, cycad, or a covering of miscanthus. Cultivation goes around these large stones.

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The road, about one-fourth of a mile from the bridge, soon leads into what looks like, from a distance, a densely wooded area. This is the settlement.

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With the exception of the rough stony land of the limestone mountains and steep slopes, the soils of the area are the Okinawa clay loams and the Chinen stony clays lying on the limestone plains. The farm and village area takes up approximately 427 acres, of which 257 are in gently sloping Okinawa clay loams, a deep, well drained, neutral to slightly acid and very fertile soil. Another five acres is of the same type but these are in slopes, of a gradient ranging from 8-15%. There are 80 acres in gently sloping Shuri clays, shallow, moderately fertile, an olive colored, crumbly, calcareous clay; another 35 acres in the Awase clays, deep fertile, crumbly, calcareous clay of olive-gray color, and 14 acres of rough stony land.

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The hillsides and the summits are free of densely growing trees and shrubs, and the lowlands are given over to cultivation. There are no groves of trees to protect the crops from typhoons. The trees and the protection they give are confined to the village. This is typical of many villages of southern Okinawa, where the hills and mountains have few trees, and dense growths are associated with habitation.

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Inside the village, winding lanes branch off the main dirt road. The older houses are on the north side of the road. On the opposite side, the houses, newer or rebuilt since the war, adjoin the cultivated area. In the older section, the dense shrubbery, the tree lined lanes, broken occasionally by stone fences, wind through the village with footpaths branching off, sometimes past an open field, a reminder of a failure to rebuild after the war. On the northern outskirts is the village office, its gong in the yard, the open field, a playground for the children.

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226 463 engaged in fishing are permanent or transient families originally from Itoman, a place name which comes up whenever fishing is mentioned anywhere in Okinawa. Agriculture and the care and utilization of the community forest make up the significant economic activities of the village.

162 Matsuda had a population of 1370 individuals (604 male, 766 female) as of November 30, 1951. There were, at this time, 243 households, an average of 5.6 persons per household. The village is said by local residents and antiquarians to be about 600 years old. If the age is 361 correct, it must be one of the older settlements in northern Okinawa. Before the war, this village was known as Kochiya.

173 Matsuda also has its lore regarding shipwrecks and foreigners. There are old men who believe Perry's party came to the village and that they left carvings on the top of a picturesque rock in the Burushii district along the coast, a not unbelievable story since the explorers certainly were not far from here.

Near the seashore, but in a very remote area, there is a natural bridge, concealed by large trees. Roots of the banyan grow through the [137] thirty or forty foot drop from the top of the bridge until they find root in the soil below. On a ledge under this bridge, there are two [164] old and open boxes which were used to collect the skulls and bones of unknown persons. Locally it is believed that they are the remains of shipwrecked sailors, possibly Hollanders. There are still 25 or 30 skulls there, and many of the bones are scattered on the ground. The place is seldom visited.

361 133 The village rests on low rolling hills. The combination of the hills, the depressions, the caves and the sinks give the topography an uneven almost rugged character. There are few flat places and these are seldom wide. They are the narrow meadows or valleys between the hills. 241 311 The hilly nature of the surroundings determines to a large extent the manner of cultivation, and historically probably has had much to do with the shapes of the individual parcels themselves. One does not see in this area the plains or small valleys with rice cultivation that is observed in Haneji township near Nago or around the island of U in Tamagusuku township, or even in the Hanashiro area of Gushichan township. In these communities, the normal pattern of cultivation is that the rice is on the lowlands, with the slopes and upland areas devoted to sugar cane, the sweet potato, or other crops, or left to native grasses. Here in the hundreds of small hills, all of these may be observed in close proximity, hard work and minute tillage comprising with the topography.

361 311 The village is subdivided into several distinct areas; (1) the main part of the village where most of the houses, the village office, the small stores, the rice mill, the sawmill, the power plant, and the barbershop are located, (2) a reclaimed area known locally as the kaikon, newly settled and with a different type of land use due to the poorness of the land and to the fact that it is a deforested area, (3) a district near the sea coast and along the sea with scattered settlements, isolated houses, and some cultivation, and (4) the forest lands, which in the

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In the center of Matsuda. Large trees growing in the settlement. Small garden plots are near the houses and sheds. These houses have thatched roofs except the tile roof in the left center of the picture. A freshly hoed plot is in the foreground.

[p. 56]

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In this illustration, the first son receives slightly over 60% of the land, ignoring type and grade within type. There was general agreement [242] in all villages that the grade of land within each classification (grades [651] 1 to 4 in dry crop land, for example) had little significance in inheritance matters. The grade is more important for tax purposes.

The example also illustrates two other principles: the natural desire to keep contiguous or close in land within the main family, using inconvenient or far off land where possible for house sites for branch families, or for arable land for second and other sons. In this illustration, the shares of the second and of the third sons could be equalized by subdividing plot #6, although its small area would not make [241] it worth while, as 75 tsubo is a very low average size for dry crop land.

Another practice, noted in Hanashiro and in Matsuda, is that the first son receives everything on the retirement of the father. This may be contrasted with a situation in which the father divides the property before younger sons marry and establish branch families. In such cases, the father might take the income from part of the property. But the more general practice is for the father to give all to the first son. Fathers may also make a will. When the first son receives all, it is the custom for him to hold property which the younger sons will need in establishing their branch families. It is in cases where the first son is given full disposition of the property that quarrels [593] are most likely to occur, for much depends on the generosity and sense of fairness of the elder brother.[3]

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In Hanashiro and Minatogawa, it is important that younger brothers receive genya land. Genya is often translated as wild land. In Japan the term is usually used to describe treeless, waste, hilly, rocky, or rolling land unsuitable for cultivation. In Okinawa, the genya land may be in the center of a rice field; it may be a rocky mound with cultivation around it. It may be land in the mountains. It is almost invariably in grass (miscanthus) with an occasional cycad or scrub pine. [137] It is not owned in large tracts. In Hanashiro, the largest single parcel [423] is 4564 tsubo (3.77 acres), in Minatogawa 1333 (tsubo) (1.9 acres), and in Matsuda 6398 tsubo (5.28 acres), but these are far above the average. In Hanashiro it is important because grass is constantly needed for [824] thatched roofs and other uses. The importance of genya and its grass was well illustrated in Minatogawa after the typhoon, Ruth, of October [731] 13-14, 1951. These villagers own little land and many have no genya. [432] They were obliged to buy the grass to replace the roofs of many of the frailer houses which had been partially or completely destroyed by the typhoon. Genya is also used for family tombs. In Hanashiro, the genya [764]

[Text continues TOP of P. 133--Analyst]

3 The problem can be appreciated by analyzing the acreage areas of each classification of land and the grades within it, bearing in mind that the average farmer has hatake, genya, and often rice paddies. These statistics will be given in the following chapter.

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

3

Care and Conservation of Land

One of the significant tasks of our time is the study of the relation between population growth and density and the exploitation of renewable and non-renewable resources: the effects of a culture on the land, the forests, the soils and the vegetation must be considered in ethnographic and geographic work. If this is not done the culture is studied as if it rested, like a plate on a table, on a geographic base, without bothering to discover the nature of the environment or what the culture is doing to it.

Nineteenth century studies of primitive and advanced societies emphasized the influence of the physical environment in molding a culture. This crude fallacy, often known as geographic determinism or environmentalism, was exploded by studies made of cultures in all parts of the world in which it became clear that the physical environment is not the cause of cultural differences.

But the reverse of this approach, the examination of what a culture is doing to its physical environment, its soils, its vegetation, and its forests has not been carried on with the vigor with which other aspects of culture have been studied. This point of view has practical significance in day to day administration. Economic matters such as foreign trade or the labor force requirement should not be a separate and independent segment for study. Changes in inheritance should not be viewed solely with reference to the family system. Forest conservation should not be regarded only as a technique and a necessary department in the government.

The effects of the devastating typhoons, for example, need no elaboration: the destruction of life, crops, houses, of boats, and breakwaters. But their effects are also influenced by other factors. The two southern villages were in the midst of some of the violent fighting of the Okinawan campaign. Large numbers of houses in both communities were destroyed by the war. The new buildings to replace them are so frail that in typhoon times they are often destroyed. This rebuilding requires more wood and more grass. Thus, such factors as the war, the inability to reconstruct permanent housing, typhoons, and the natural growing of miscanthus grass are joined together in a close relationship.

In the south the relationship of typhoon destruction to deforestation is striking. There is need for tidebreak groves and shelter belts along the coast to protect crops from wind and salt-water spray, a need which fortunately the Ryukyuan Forest Agency is attempting to meet. Deforestation in the south seems inescapably tied up with long occupance. The center of population has always been in the southern part of the island. Not only should there be trees, but they should be planted in the right places. The deforestation of

In the areas studied, no serious sheet erosion was observed
No doubt this may be a problem in parts of Okinawa, but it is doubtful that this menace will threaten the habitability of the island. Occasionally one can see a freshly hoed field on a slope that is losing its soil during a downpour. But the fact that the hills and mountains are covered with vegetation, are not too steep, and that grasses and shrubs are cut off allowing the stubble with the roots to remain in the soil effectively binds the soil of the hills and at the same time prevents flash floods. With the exception of stony soils, the land of the areas studied had a plant cover. This statement is not inconsistent with the previous remarks regarding deforestation, as the disappearance of the pine, the cycad, and the pandanus has been offset by the spread of kaya (miscanthus) grass. Boundary paths also keep the soil in place. They often roughly follow the slope and are sufficiently crooked and winding and of sufficient depth to prevent washing away of large quantities of soil. While there is no complex irrigation system in these areas, the small ditches which carry the water down the slope are winding and covered on their borders by weeds. Occasionally one can see a farmer shovelling up the soil accumulated in a natural catchment in a bend of one of these ditches and restoring the lost soil to his land.

134 133 137 185 [887] [317]

In all areas, equally simple devices to protect the soil could be observed. Roadside borders of stone, like the stone of a rock garden, often line the fields adjoining main roads. (One could write a long essay on stones and the part they play in the culture of the people). These stones come from the fields. If fields do not have stone borders, weeds are left to grow. They are cropped, but the roots are left in the soil. In Hanashiro, stone fences on slopes and contour breaks are a common sight. Sometimes these have the appearance of blunt wedges, the end of the wedge going up the ravine. These stones have been painstakingly gathered from nearby areas.

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Terracing is practiced in a crude form in these areas. It really is step or bench cultivation, the plots being above one another in step like order. The function of terracing is, in the case of the dry crop land, to bring more land under cultivation, protecting it from washing away; in the case of the rice fields, it supplies flat land for cultivation at different levels. In the areas studied, terracing did not go all the way up the mountain side, although this practice can be observed in parts of Okinawa.

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Very frequently the ledges of the terraces are covered with a border of weeds or cropped grass which prevent soil runoff down the hill. In the Matsuda area, rice is grown up a narrow mountain valley, or ravine, with trees and shrubbery on the hillsides growing to the very edge of the cultivated plots. In rice terracing, the boundary paths often divide one step from another with openings in the ditches to allow the passage of water to the level below.

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The starch comes from two sources: the large oval seed, ranging from orange to Chinese red when mature, and the stalk. Use of the stalk involves destruction of the plant. According to Oushichan area residents, the starch of the cycad seed was used for food in 1945, 1946, and parts of 1947. Timing is an important part of the starch making because at certain stages of development the cycad is poisonous. Today in areas where the cycad is plentiful, the seeds are still gathered and dried in large quantities. Toward the end of November in Oku and in the nearby mountain village of Hedo, and in other villages of the far north of the island, large quantities of cycad seeds can be seen drying in the compounds. In the Hanashiro and Hinatogawa area, the cycad is not plentiful enough and is too scattered for these uses.

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The main uses of miscanthus are: (1) roof thatch, including the saddle back which caps the roof, (2) firewood, (3) the younger shoots for animal food, (4) fertilizer, (5) a raw material for home weaving of baskets and slings for carrying vegetables.

Miscanthus can be seen to best advantage in December when it is in full bloom and covers large areas of the uncultivated countryside. Considering the present economic situation in the south, these plentiful grasses are indispensable to daily living. One must see, from day to day and with his own eyes, the dependence on these wild grasses to appreciate the force of this statement.

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In the southern area studied, one consequence of the war on the natural vegetation was the spread of the grasses at the expense of the pine and the cycad. Residents of the Hanashiro, Oushichan, and Hinatogawa areas have said that prior to the war, the Ryukyuan pine was plentiful and covered hill and mountain sides now quite bare, save for an occasional scrub tree. These trees were destroyed by bombing and firing. There are occasional evidences of regrowth due to natural seeding, but the clumps are small, and nothing like a stand is growing. The stands even before the war, however, must have been inconsequential compared with descriptions of the area fifty years ago given by old residents of the area. The present deforestation of large parts of southern Okinawa seems to have accelerated in the recent past.

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The cycad had a similar fate in the south. The plants are numerous in the sense that one can always be observed on a walk. They grow in clumps, often alongside the pandanus. The grasses seem to have displaced the cycad and the pandanus as well. The dense settlement, [311] cultivation, use of trees for firewood, and the recent war account for the uncultivated hillsides in which the grasses now predominate, and on some of which not a single tree or shrub is to be observed. The original native vegetation, perhaps, may still be preserved in the limestone sinks which occur here and there in this area.

In Hanashiro, the absence of trees and shrubs except in the settled areas has already been noticed. This is a characteristic of villages in the south. The treelessness of Hinatogawa is exceptional.

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

1

An Historical View of the Okinawan Forest

Northern Okinawa is the woodshed of the island, and there is a steady stream of lumber for building, poles for a variety of uses, charcoal, and of small bundles of wood for the people of the south. In the village of Matsuda, the forest is part of the daily life and economic well-being of the people. 313

Little is known of the past history of the Okinawan forest. 137 174

> "Though it is impossible now to determine the nature and distribution of the original forest cover, it seems reasonable that the major part of Okinawa was originally covered by trees. The forest was probably absent from the beaches, a few marsh areas behind the beaches, rock ledges upon which trees could gain a foothold, and perhaps some areas of Regosols (shallow soils) from calcareous clays in the southern part of the island. It is evident that the present forest has been cut over many times. There seems to be no part of the island in which the forest cover has not been disturbed in some way by man."[1] [311]

The virgin stands have disappeared and left few clues, these authors continue, but it is likely that the original forest cover was comparable to the present stands in composition of species. The authors point out the relationship of cutting to settlement. Cutting must have been a continuing process. In Saion's time, in the 18th century, there was considerable tree planting and measures were taken to protect groves of trees for their value as windbreaks. Excessive cutting could hardly have taken place in olden times in the central areas of the north, whose trees, even today, can be reached only by footpath. No doubt in the past cutting has spread out from village sites and travelled roads. Fire may have been one cause of deforestation, as it has been used to clear land. There are still instances of this. 137 311 174 [245]

In Okinawa, the period from 1879 to the end of the Russo-Japanese war seems to have been one of widespread deforestation. (This was contemporary also with the reckless deforestation in the New World). The period after 1906 reflected Japanese concern with forest preservation, especially of the nationally owned forests, a program pursued with varying degrees of success. [185]

1 Okinawa forests (U.S. Geological Survey. Mil. Geol. Sect., Office of the Engineer, GHQ, FEC), 1948, 2.

1: Glacken E-5 (1951-1952) 1953 AC7 Okinawa AC7

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Hatsuda
Land Classification

Type of Land	Area in Tsubo	Approx. Acreage Equiv.
Rice (ta)	82,151	67.9
dry crop land (hatake)	188,305	155.6
House sites (yashiki)	17,056	14.1
Village Owned forest (sanrin)	1,259,104	1040.6
Wild land (genya) a/	376,660	311.3
Village Owned shelter belts, groves	33,654	27.8
Religious sites (haisho)	2,883	2.4
Public building sites	81	b/
Miscellaneous	3,183	2.6
Total	1,963,077	1622.3

a/ Includes village and privately owned, but almost all is privately owned.

b/ Less than 0.1 acre

Source: Ginoza-son township office, Ginoza village, Okinawan Island. Dec. 1951.

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The coniferous forest (shinyōjurin) is along the shore, reaching inland short distances in those areas not given over to cultivation. Pine stands are valuable for typhoon protection. Inland, about half a mile to a mile from shore, the coniferous stands give way to a dense mixed forest of deciduous trees and shrubs. The predominant species in this broadleaved forest (katsuyōjurin) is a live oak, the shii. Ordinarily the shii grows to be quite large, but here in the dense stands its growth is stunted. While not impenetrable, it is difficult to go through these stands once one is off the foot path. Along these paths, there are huts where one may drop in for rest or shelter, charcoal kilns, stacked firewood (maki), and piles of long poles which have been cut and stripped to be carried down the mountain paths to the road for loading in trucks. [485]

The woodlands of this area may be classified, according to use, into two categories: (1) stands, groves, or clumps of trees which provide typhoon and windbreak protection (hoanrin). Shore shelter belts or groves are known as bōchōrin, those inland or on mountain tops as bōfurin. (2) The forests, maintained and used as a resource, for such materials as firewood, lumber, and charcoal.

In Hatsuda, trees are used both for protection of houses in the

137 settled area and for protection of the surrounding crops. Around
311 houses, there are common stone fences, bamboo fences and trees.
Stone fences, though solid may be toppled over. Bamboo, or dwarf
[417] bamboo fences, seemingly slight, resist the winds and remain intact because of their flexible loose weave.

137 The trees on the ridges of the low lying hills or on high pieces
133 of ground are tall, and sturdy, and jealously protected. The villagers
185 take great pride in them. Today this pride is based on the realisation of their effectiveness; in former times, their protection was associated with the worship of the gods of the sacred grove (utaki). There were
[918] beliefs, which now seem to be dying out, that cutting these trees
[917] would bring bad luck. Many villagers say that Saion in the 18th
[193] century intentionally invented superstitions concerned with the cutting of the trees in order to save them. Now these trees are no longer in danger of cutting, even though the penalties of the old beliefs are no longer feared.

The following short list does not exhaust the kinds of trees and plants found in this area. It is confined to those trees, shrubs, and grasses which are most frequently found and which have the greatest local importance.

824 (1) The Ryukyuan pine (Riukiu-matsu in Japanese, Pinus luchuensis
313 Mayr). This tree is still one of the commonest sights of the island, even in southern Okinawa. At present, it is a source of firewood, cheap lumber, and siding. It is not considered good housebuilding material because of termites (shiroari). Pine was used for fishing boats within living memory, but now they are made of much harder woods. In this area, the coniferous groves are along the seashore. The larger stands are not cut. Scrub pine on individually owned wild land may be cut for firewood.

(2) The fukugi (Garcinia spicata Hook.). The fukugi is used around homes and on mountain ridges as a typhoon protection. It is fairly plentiful here and prized as a building material (kenchikuzai). The hard studs, beams and cross beams and the wide plank floors in the older and better houses are often made out of this wood.

(3) The iju (Schima luchuensis Nak.). This tree, common here, is used as a building material and is considered to be better than the Japanese redwood (sugi). It is not regarded as a good firewood.

(4) The inumaki (Podocarpus macrophyllum D. Don). This tree is not well known here, and there are no large specimens. But it is regarded as the best building material when available. Often the large, hard, rough hewn poles which are placed on stones and support the eaves of the older houses are made from this wood.

(5) The shii (Shiia cuspidata). The dense stands of this tree in the village owned forest restrict the size of the specimens, though

fuel. The usual practice here too is to clear cut up a steep hill or mountain, the lower and more convenient the spot, the more efficient the clearcutting. Weeds, shrubs, grasses, and the Yambaru bamboo have quickly taken the place of the trees. The man induced climax vegetation is grass and shrub.

Forest destruction in Okinawa does not seem to have reached the alarming proportions observed in Japan.[6] The destruction of the war increased the demand for lumber and firewood. This demand accelerated the dangerous practices and led to widespread waste.[7] Fortunately, if Matsuda is a good example, the roads were poor and underdeveloped, and the mills small. There was some brake on uncontrolled deforestation.

In the accompanying photograph of the Matsuda forest area, there was access to the summit and the trees there were cut down. For some reason, probably the steepness of the mountain side, the pine and shii on the slopes were not cut. The result was that tall stands of dwarf bamboo took over the spaces on the summit left by the trees, while the trees continued to grow on the mountain sides.

Since the forest is owned by the village, any resident may cut trees for his own use. This custom has few dangers because it is a large forest with a small population in the environs. The cutting is scattered. The villager selects the tree with the consent of the village official in charge of forest control, cuts it and takes it to his courtyard. There is a charge of Y1 for each large tree, or Y1 for five small trees. This money goes to the village office. Villagers' personal needs are a small drain on the forest resource.

The village government also sells wood. In lulls in farming, or when the farmer needs some cash, he may cut trees for the village. Wood cutting for lumber is a year round activity. September to December is the season for cutting firewood. There are two common practices in commercial dealings with wood and lumber. For cutting and gathering firewood, the village office pays Y5 a bundle, Y4 goes to the person cutting the wood, and Y1 to the village office, 60% of which it retains and 40% going to the township office.

Cutting and gathering wood is by no means an easy task. The walk to the forest may take an hour one way, though there may be truck transportation part way. The trees must be cut, the wood chopped up and made into the familiar bundles tied with a stout rush (often the i) and carried back or put in a central location to be picked up later. This marketing of wood on an individual basis is casual and intermittent. More continuous and larger scale exploitation takes place when the village office sells a certain area for cutting. The village takes 60%, the township 40% of the proceeds.

6 Ibid, 285-87. [Text continues on p. 232.--Analyst]
7 Okinawan forests, as cited, 2-3, 5-8.

the community is dispersed. In the outlying parts, as far as 2 miles from the center (see map 1), the houses are scattered between the paddies or farm lands in sections which form subvillages or wards. As mentioned above, settlers from the south took up residence in these areas. Recently families from the main village have also moved to the more remote parts of the community, such as Udenaha, because they can reach their fields more conveniently. Although the name Taira refers to the political unit of main village and outlying parts, including Udenaha and Izena, most references in this study pertain only to the central community. Its 60 households, with about 330 individuals, form the primary social unit from which the sample of 24 children was chosen.

Central Taira nestles along the inner shore of Taira Bay, which opens into the Pacific Ocean. At this point the median range mountains recede from the coastline. Behind the village, rice paddies spread in a crazed pattern at the bottom and on the terraced sides of several valleys which are separated from each other by sparsely wooded hills. Here and there the red earth of an eroded section shows like a scab through the green slopes.

In traveling by road from the south, most people choose the highway along the East China Sea coast, which is connected with the road which crosses the island. Higashi township is entered through a low saddle in the mountains which separate the two coastlines. To the right and left begins Taira's forest. Central Taira is reached through a winding lane bordered by pine trees. To the left the view opens into one of the neatly cultivated rice fields, backed by the hills on whose flat tops and terraced sides village people cultivate their farm lands.

The central village itself lies on a sand bluff, separating the valley from the ocean, so that there is a slight drop toward both sides (see map 2). The main road runs the length of the village. Except for the thoroughfare, which is dirt and gravel, the side roads are not surfaced, and after heavy rains puddles form and remain for more than a day, to the delight of children who play in them.

When Taira was destroyed during World War II, along with its houses went much of the foliage which once served as a windbreak. A few fukugi trees * line the main street, and hibiscus hedges here and there hide some of the houses from a first inspection. There are bushes around the edges of the village.

The war-time destruction is hardly apparent on a first walk through the village. Along the main street, lined by houses, one finds the rice mill, a substantial new building of concrete and wood, the police sta-

* A small- to medium-sized evergreen tree with a narrow, upright, very dark green crown of leaves.

[TEXT CONTINUES ON P. 377]

2:Maretzki & Maretzki E-5 (1954-1955) 1963 AC7 Okinawa AC7
Taira

tion, a frame wood building, and the main store. On the eastern end of the village the road opens into a little square in front of the simple, open prayer house with a small concrete shrine in back, housing three sacred stones. Beyond these is the township office crowned by a mighty pine tree of tremendous and symmetric proportions, acclaimed by Taira people to be the oldest existing pine in Okinawa. Across from the office are the post office and the dispensary.

Closer inspection of the village shows former house sites which were not rebuilt. Some still have empty concrete shells or single concrete walls and abandoned pigsties or storage sheds. Some of the vacant lots are used as potato fields, others as play areas, the favorite being a large house lot surrounded by a concrete wall, near the main store.

Houses are set back a short distance from the roads and paths, and most face south. In spite of the hedges and trees, the house is easily accessible from the street—its orientation is therefore toward the community as a whole and, as will be seen later, open to visitors who can enter freely without going through winding garden paths and knocking on doors or entering through long corridors and passages. Each house lot is small, ranging from 1300 to 6050 square feet. Houses are set so close to each other that neighborly conversations from one to the other can be conducted without leaving one's premises. Although some privacy is attained by the hibiscus hedges and fences, few secrets can be kept from neighbors.

There are several focal areas where people frequently meet and interact. The main store is a geographical center. Its two bulletin boards make it a natural congregating point. The banyan tree, overshadowing the village office and the lower water tank, is another such place, and on any day of the year scores of children can be found on or under it. In prewar times it was flanked by important structures, but now the empty lots, which are adjacent, form a green which is used on good days for village meetings.

South of this green, and close to the water, stands the old warehouse, a concrete structure with tile roof which once served as a storage center for agricultural products shipped south by boat; now it serves as a village meeting playground, especially on rainy days. The open space around it, bordering on the sea wall, is also used as a play area and as a gathering place for young adults. Here people prepare firewood for sale and stack it to be picked up by the village truck. Houses once stood near the 10-foot sea wall but were not rebuilt after the war.

To the north of the store lies the upper water tank. Until several standing faucets were installed in 1955, this used to be another place where people met frequently. Water is diverted from a stream a mile

312 water is diverted from a stream a mile
365 above the village and piped into the upper and lower tanks where
[482] people fill their buckets which they carry home on a shoulder yoke.
[859] Both tanks always attract children. Before faucets were installed, the two spigots on each tank were closed with a wooden stopper which the children often pulled to get a drink or water to play in. An open lot surrounding the upper water tank is another popular play area.

361 On the eastern side of the village below the main road lies a flat sandy plain, separating the actual beach from the houses above. Children are frequently found playing there or walking along the beach
[764] to the mouth of the Noro Mata and Fukuji rivers, which reach the sea
[211] about 400 yards away. To the west of the central village lie the tombs and the monument for the war dead of the village.

487 Many hills around the village drop off vertically toward the south;
[133] these drops are partly effects of the geological conditions, such as karst depressions, partly caused by erosion of drainage during the heavy rains. Narrow paths, leading up the steep claylike hillsides, are slippery
[491] and very treacherous during rains. On the way to school in Kawata, the neighboring village, children have to pass a section of the road where river and rains have washed away the bank so badly that a misstep on the edge of the road could lead to a fall of more than 50 feet.

312 The little river which runs through parts of the valley behind Taira
[857] is another gathering place of children. A path alongside it leads into
[487] the hills and mountain forest lands. Seven minutes walking along this path takes one to Umugui, a natural swimming hole which also serves as one of the favorite laundry places. During the summer the river offers several other popular swimming spots downstream from Umugui.
[296] There is also a little concrete bridge in the rice fields beyond the houses, where adults and children go to wash laundry and sometimes pots and pans. Yamagawa well is a water hole, lined with concrete, near the northwestern part of Taira. Before water faucets were installed, girls frequently went there to wash their hair and do laundry.

859 Children go to the fields to look for flowers and berries or, in the
[484] case of older boys, to cut grass for animals. Distances covered by any child depend, of course, on the age. Younger siblings under 5 accompany the older ones to places beyond the area, but no expeditions extend to areas that are not also regularly traversed by adults in the course of their daily duties. Perhaps because of the multiple rivers and water sources, the beach offers less enticement than one might expect. On some days a group may decide to play on the beach, but since sand is also available throughout the village, everybody will soon shift back to some other area inland.

137 Tropical plants, bushes, and trees grow at sea level. At higher ele-

2:Maretzki & Maretzki E-5 (1954-1955) 1963 AC7 Okinawa AC7
Taira

vations one finds temperate zone forests. Typical for the area are numerous grasses growing along the mountainside and on top of hills. Among them, the most permanent in appearance and use are miscanthus grass and a dwarf bamboo. Panadanns bushes line the beaches and areas close to them. Pine trees are common. Fukugi trees grow in the village but also in the hinterland. Here and there cycad palms lend the scenery a special tropical touch. Wild flowers grow almost all year.

The heavy underbrush is the habitat of several species of poisonous snakes for which the Ryukyu Islands are notorious. The most common, the *habu*, a pit viper, feeds on rats and other small animals and often enters the actual village area. Since rats outnumber humans in Okinawa by an approximate ratio of three to one, these snakes find ample food. Their search sometimes takes them into the rafters of thatch-roofed houses. This danger is present from March until October. People are bitten if they happen to step on the hidden reptiles or sometimes while they sleep. Children are taught by their elders to be careful, and during our study no children were bitten.

Insects are another source of irritation. Mosquitoes attack quite viciously during the summer; fleas, which live in the sand and in straw or reed mats, inflict bites at any time but are seldom carried in clothes. Flies do not seem to annoy the villagers although they are thick wherever food is left in the open and near the pig pens and outhouses.

The number of motor vehicles passing through Taira is small. A few heavy lumber trucks and an occasional U.S. Army vehicle drive through the main street. Four buses daily, two in the morning and two in the afternoon, connect Taira with other villages in Higashi township and the rest of the island. Because traffic is sparse, and it is difficult to catch a ride, persons intending to leave the community in the middle of the day often take the 50-minute walk to the other side of the island where buses pass every 30 minutes on the coastal highway. Villages frequently take trips to the nearby provincial market town of Nago or even to Naha, the capitol.

THE CLIMATE

In spite of Okinawa's subtropical geographic position, it has distinct seasonal differences demanding appropriate adjustments in living routine and clothing. Temperatures in the Taira region may reach a minimum of 38 degrees in January and February and a maximum of 96 degrees in July or August. The average daily mean temperature,

231 [417] Before a piglet is bought, its feeding habits are carefully observed by the buyer to determine future growing potential. It is then kept in a sty; pigsties are either in the yard near the house or in a cluster of stables on the north edge of the town. Twice a day women cook the food in large kettles and ladle the liquid food into a trough. Nowadays [262] pork is rarely consumed in the village except for special holidays, when several families may slaughter pigs and sell part of the meat to everybody through the local store or preserve some of it by salting. Most [438] farmers, however, wait for the meat buyer from the southern part of [251] the island from whom they receive a good financial return. [442]

Goats are raised for home consumption. They are never left to graze [417] but are quartered in a goat pen near the pigsty and fed on grass cut from uncultivated land. Seven families in the central village have [492] horses. Their main use is to carry firewood from the mountains. The small breed looks like a cross between a horse and pony and seems especially adapted to climb the steep trails. They are also used for plowing and for pulling two-wheeled carts. The owner of a horse [434] may more than double his income from forest work. Horses are frequently [427] rented out for half the day's income from wood carried by them.

Silkworm raising, an important source of income in Taira before the war, is only now being resumed by some Tairan families. The [474] larvae are supplied through island-wide silkworm raising associations, which repurchase the cocoons after they are spun. To raise silkworms, a substantial house is needed so that rats cannot enter and eat the worms. The temporary postwar structures with holes and cracks in the walls and roof are inadequate. Only a few recently built houses can be used. One family keeps growing worms on shelves in the front room. [137] Most of the mulberry trees were lost during and after the war. Plans have been made to plant new trees. Young girls feed the mulberry [462] leaves to the gluttonous worms who require constant attention. When the worms are ready to create their cocoons, they are taken off their diet, and the cocoons are cleaned and sorted out. Silkworms can be raised four times a year if there is an adequate supply of mulberry [434] leaves. Their sale brings a good income, which can become a substitute for cash earned in forest work.

FISHING

226 [554] Fishing is a much less important source of livelihood than one would expect in a coastal village and is a low-prestige occupation. Only two

CHAPTER I: GEOGRAPHY

F. R. Pitts

131 Location Okinawa is a longish island, lying about halfway between Formosa and the southern tip of Kyushu. Together with clusters of islands lying both to the east and west, it forms the political unit known as Okinawa Guntō.

133 Along the axis of Okinawa, which trends from southwest to northeast, there is a fairly simple division into a plateau-and-mountain northern half, a central plateau area, and a low rolling southern knob. The Motobu peninsula juts westward from the northern, or Kunigami, half and forms a distinctive area. Between the Kunigami mountains and the peaks of Motobu lies the ricebowl of Okinawa---the Haneji lowland.

311 241 Arable Land In general it can be said that the farm population increases as one proceeds south. Map 2, showing the arable land under cultivation as a percentage of the total land area, illustrates this.[1]

Farms in the mountain and plateau north are found in incised V-shaped valleys. Water is plentiful, and rice paddies cover the valley floor. Villages hug the edges of the flat land, and incredibly small sweet-potato terraces rise up the valley's edge. [137] Atop the plateau one finds only silence, and a dense growth of trees and bamboo. [132] Many of the people in the valleys are part-time foresters. The Motobu mountains guard from the frequent typhoons little settlements famed for growing the indigo plant and pineapples. The peninsula's north shore is a fertile but ever-narrowing extension of the Haneji lowland.

In the central plateau area---Nakagami---sweet-potato fields compete with scrubby forest for space on the plateau. Where sufficient water is available, rice fields cover the tiny valley floors and the low-lying coastal fringes. [134] The triangular southern end of the island is known as Shimajiri in popular terminology. [132] Shimajiri is blessed with the greatest concentration of fertile arable land on Okinawa. But the blessing is somewhat reduced by greater exposure to typhoons and a chronic water shortage. Sweet potatoes and sugar cane rank first among crops here.

311 241 [242] Riceland Okinawans prefer to eat rice rather than sweet potatoes whenever possible. It is a paradox, however, that areas of greatest farm population grow the least rice. The thinly populated north has the greatest amount of riceland. Map 3 charts the distribution of riceland---or flooded fields---on Okinawa. Even in the southern 'son' of Yonagusuku and Kanegusuku flooded fields often contain the mat rush rather than rice. It is a good cash crop, and is sturdier than rice when typhoons roar through the islands.

[128]

[1] The figures upon which the maps in this section and the population section are based are found in Appendix A. The figures for Japan and Kagoshima-ken are given for comparative purposes. Of all the prefectures in Japan, Kagoshima most nearly resembles Okinawa in climate and emphasis upon sweet potatoes as a staple food.

241 311 312 **Yields Per Acre** Because Okinawa is a sub-tropical country, crops can be grown the year around. Hence the low productivity of a land subject to natural disaster such as drought and typhoons is somewhat compensated for. In the limestone areas of Shimajiri ground water is scarce except after fairly heavy rains. Nanahan has nine small ponds, or kumui, where people wash clothes and sweet potatoes and in which grows the water convolvulus, or unchēbā. Farmers say that if a drought lasts three months, crops do not yield at all. All remember the great drought of 1895 (Meiji 28-nen) when no rain fell for seven or eight months. Even wells dug in river bottoms dried up. The 23 households of Nanahan at present have eight small wells and one large community well which was dug in 1948. Little ditches on the hillsides lead rainwater to the rice paddies, and are fixed so that the water can be directed into wells. If a paddy field is near the farmer's house, a drainage ditch is dug to it for the disposal of used household water which is considered to contribute to a field's fertility. Tables VII and VIII show the yield of crops in Okinawan and American terms.

241 433

Table VII

Crop	Yield per tan[1]	Bushels per acre[2]
Summer rice	1.10 koku	41.1 bushels brown rice
Winter rice	1.15 koku	43.3 bushels brown rice
Upland rice	.72 koku	26.9 bushels brown rice
Common barley	.51 koku	10.4 bushels
Wheat	.59 koku	12.1 bushels
Naked barley	.52 koku	10.6 bushels
Millet	.38 koku	7.85 bushels
Common European millet	.40 koku	8.17 bushels
Soybeans	.70 koku	14.3 bushels
Green peas	.55 koku	11.3 bushels
Broad beans	.71 koku	14.6 bushels
Kidney beans	.71 koku	14.6 bushels
Peanuts	.83 koku	17.2 bushels

Table VIII

Crop	Yield per tan	Tons per acre
Sweet potatoes	1,762 kin	47.6
Irish potatoes	2,176	58.8
Cabbage	3,540	96.1
Other leafy vegetables	1,669	45.1
Giant radish	2,677	72.2
Carrots	2,439	65.85
Pumpkins	2,090	56.5

[1] Ryūkyū tōkei hōkoku, Vol. 3, No. 3, p. 1, 1953 (data for Okinawa Guntō).

[2] Converted according to standard indices, as given in SCAP, Natural Resources Section, Report No. 143, Tokyo, 1951.

Table VIII, cont'd.

241
433

Crop	Yield per tan	Tons per acre
Cucumbers	1,570	42.4
Wax Melon	1,859	50.2
Tomatoes	2,789	75.5
Watermelons	1,557	42.0
'I' rush ('Bingo-i')	1,411	38.1
'I' sedge ('Shichitō-i')	1,715	46.3
Tea	197	5.32
Mandarin orange ('mikan')	1,183	31.95
Edible banana	1,629	44.0
Green manure crops	2,994	87.5
Sugar cane (cane weight)[1]	9,000	243.0

Use of Grass, Trees and Brush Southern Okinawa looks barren to the American observer---few trees break the skyline and great fields of long grass cover the hillsides. The comment heard most often is, "Why don't the Okinawans plow up the grass and plant crops, instead of letting all that land go to waste?" The only proper and truthful answer to this query, of course, is that the grass is utilized to the full and that none "goes to waste". 311 311 824

The "ubiquitous miscanthus" referred to by Glacken actually comprises many grasses, chief among which are 'susuku', 'kaya', and one known by the Okinawan name nāichū. 'Susuki' is used mainly for the making of brooms, which occurs in December after the flowering of this grass has turned the countryside from deep green to a cloudy whiteness. 'Kaya' is used mainly for the thatching of roofs, but is also fed to livestock. Among other plants of the wild land, or 'genya', are the 'mogusa' or fūchibā, used for moxibustion and as a vegetable in soups; the hirahāgusa, used to cure leech bites; and the warabinufūnii, or edible bracken fern. [137]

The Japanese butter-bur is found in the 'genya', and is utilized as a tobacco substitute in hard times, and occasionally as food. The flowering ginger, or sannin, furnishes leaves for wrapping rice cakes, and fiber for the tying of bundles of sugar cane. The leaf of the inedible potato or m-bashi (Japanese, 'kuwazu-imo') was used by very poor people before the war as a wrapper for 'miso' paste, which they peddled throughout the countryside. The plant is still used to stop the bleeding of wounds. The lantana---known in Hawaii as "haole-koa"---furnished poles for house roofs, leaves for fodder, and beans for tea during famines. Numerous other grasses and herbs are used by the older generation for medicinal purposes, as can be seen by perusal of Tawada's excellent book, Okinawa Yakuyō Shokubutsu Yakkō, 2nd edition, Naha, 1951. [176]

Almost all trees, which in Shimajiri means essentially those surrounding the houses, are used in some way above and beyond their major function as windbreaks in time of typhoons. The leaves of the yūna tree are a native

[1] This information is from the Kochinda-son Office.

261 262 Famine Food and Wartime Substitutes The standard famine foods on Okinawa have always been dried sweet potato chips or refuse from the making of starch, sago palm nuts and the pulp of the same palm. The latter two are eaten with restraint, as they contain small [252] amounts of an alkaloid poison. The sweet potato materials are made into soups, and the sago palm provides a type of flour for deep frying, or 'tempura'.

• [137] During the last war, soups were also made from the stem of the plant Ligularia Kaempferia, known as 'tsuwabuki' in Japanese, and chiipappā in Okinawan. One Nanahan farmer related, "The chiipappā which I ate in Kin-son during the war was delicious, and one felt better after eating it. When I came back here, I tried our local variety, but it is bitter and inedible." The [252] giant African snail was used to alleviate famine just before the invasion. It was boiled in its shell, then de-shelled and the "snail juice" washed out with a bitter orange called shiisā. The meat was then fried with vegetables and the white part of a leek.

273 177 Japanese soldiers during the war taught the Okinawans how to make a strong liquor from sugar cane, as no real 'sake' or 'awamori' was then avail- 276 able. Tobacco was also scarce, and pine tree bark was substituted. Some people preferred to smoke the leaves of the 'mogusa' plant, which is also used 272 for cautery. One very poor family in Nanahan still retains the practice. Tea could not be bought in the late pre-invasion period, and the beans of the lantana bush furnished a palatable substitute.

263 Uses of Sugar in the Home When a guest calls at an Okinawan farmer's home, [574] he is served tea, black sugar chunks, and quite often 'awamori'. Many other uses were related. It is used in batter for deep [757] frying; for cure of headache, sickness, and fainting spells; for a hangover; and when food is not delicious.